

Section 1 MANAGEMENT OF CHANGE (MOC)

MOC No: 25789	Originator: Palumbo, Terry A.	Date Issued: 11/17/2012	Passport No:	EWO No:	ABU: D&R	Plant: 4 Crude	Year: 2012
Section 2 Reviewer: Preciado, Silvano E.	MOC Category: S/D	PSM:	MOC Type: Permanent	Expiration Date:	Other Temporary Reason		
Project/Equipment Title: 4 Crude Recovery - Process Piping Systems Material Changes							
Description of Change: To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR. This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C 1100 inlet transfer line.							

TAW# - 17271, 17311, 17312, 17531, 17532, 17548, 17568, 17598, 17599, 17600, 17604, 17621, 17622, 17623, 17812, 17826, 17832, 17844, 17848, 17849, 18237, 18319, and 18405.

MOC will be required if the change will:

- ☐ Cause the use of different feed, chemicals or catalysts?
☐ Cause the use of different process conditions, process control, instrumentation, and protective devices or affect upstream/downstream plants?
☒ Cause the use of new or modified equipment [which is other than inkind]?
☐ Alter equipment siting, building, trailer locations, roads or fire protection?
☐ Require modifying existing and/or developing new procedures?

Section 2

☐ Simultaneously Begin Construction and Start-up

Stage 1	Pre-Implementation	Dept./Person Responsible	Date Complete	Completed By	References
	Design Review	Taylor, Patrick J.	#####	Taylor, Patrick J.	
	Process Engineering Review				
	Instrumentation Review	Ketner, Joseph A.	#####	Ketner, Joseph A.	
	Control System Review				
	Utilities Review				
	Environmental/Regulatory Review	Chamberlin, Robert T.	#####	Perez, Carlos	
	Safety/Regulatory Review	Kirby, Anthony A.	#####	Kirby, Anthony	
	Building Permits Review	Tuma, Dennis A.	#####	Tuma, Dennis A.	
	Mechanical Review				
	Inspection Review	Beauregard, John T.	#####	Beauregard, John T.	
	Metallurgy Review	Prasad, Praneil-Maharaj	#####	Prasad, Praneil-Maharaj	
	Contruction Review	Costa, Steve W.	#####	Costa, Steve W.	
	Leak Seal Review				
	Relief System Review	Muha, Edward	#####	Muha, Edward	
	Infrastructure Review				
	PHA/HSE Review	Simmons, Corey	#####	Simmons, Corey	

Authorization to Implement Change (Begin Construction): Approver: Preciado, Silvano E. Date: 11/21/2012

Stage 2	Pre-Startup	Dept./Person Responsible	Date Complete	Completed By	References
	Procedures Review	Bessire, John P.			
	Communication/Training 1	Bessire, John P.	#####	Bessire, John P.	
	Pre Start-up Safety Review	Simmons, Corey			

Authorization to Start-Up Change: Approver: Date:

Extension of Temporary Change Approved By:	Approver:	Expiration Date:	Extention Reason
--	-----------	------------------	------------------

Stage 3	Post-Startup	Dept./Person Responsible	Date Complete	Completed By	References
	Communication/Training				
	Process Safety Information				

Change in Place - Reviews, Documentation & Testing Complete Approver: Date:

MOC Cancelled: Approver: Date: Cancellation Reason:

Note 1: Emergency request for change should be routed by the Approver on the next working day Retain Original in Division for five Years

DESIGNS REVIEW CHECKLIST

You have been assigned a Design Engineering Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number 25789

Filing Reference

Person Responsible Taylor, Patrick J.

Completed by Taylor, Patrick J.

Date Completed 11/21/2012

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR. This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.
TAW# - 17271, 17311, 17312, 17531, 17532, 17548, 17568, 17598, 17599, 17600, 17604, 17621, 17622, 17623, 17812, 17826, 17832, 17844, 17848, 17849, 18237, 18319, and 18405.

ENGINEERING REVIEW

- ☐ BIN Best Practic
- ☐ Civil & Structural
- ☐ Equipment Data Sheet
- ☐ Equipment Specification
- ☐ Fire Protection
- ☐ Hot Tap
- ☒ P&ID's Change due to New / Modified equipment
- ☒ P&ID's Change - Field condition not matching existing P&ID
- ☐ Plot Plan
- ☐ Seismic
- ☐ SIS Update
- ☐ Temporary Leak Repair

EQUIPMENT REVIEW

- | | |
|--|--|
| <input type="checkbox"/> Columns & Pressure Vessels | <input type="checkbox"/> Instrumentation |
| <input type="checkbox"/> Compressor, Blowers & Mechanical Equipment | <input type="checkbox"/> Insulation |
| <input type="checkbox"/> Concrete & Steel Structure, Walks and Stair | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Control Rooms & Building | <input checked="" type="checkbox"/> Piping |
| <input type="checkbox"/> Exchangers, Condensers, Heaters & Cooling Tower | <input type="checkbox"/> Pumps & Drivers |
| <input type="checkbox"/> Facilities & Siting | <input type="checkbox"/> Relief & Venting Systems |
| <input type="checkbox"/> Foundation | <input type="checkbox"/> Sewers, Roads & Miscellaneous |
| <input type="checkbox"/> Furances & Boilers | <input type="checkbox"/> Tanks |
| <input type="checkbox"/> Honeywell | <input type="checkbox"/> Update Refinery Relief Study |
| <input type="checkbox"/> Honeywell Process Simulator | <input type="checkbox"/> Utility Systems |
| <input type="checkbox"/> HVAC | |

SUMMARY OF REVIEW*

The piping that is captured under this MOC is primarily replacement in kind, with a metallurgical upgrade to 9cr-1mo for increased corrosion resistance. The previous pipe class was either A, AE, B, BA, TF1, or TF2. The new pipe class which is being installed is "QF2". This pipe class has properties at temperature better than (higher pressure/temperature) the previous piping installed.

All piping upgrades to chrome had a full stress analysis completed in accordance to CES guidelines. This included an evaluation of the pipe stress, support reaction loads, and nozzle loadings. One line routing modification was made (0955-007-001) to more efficiently route the piping. This resulted in an additional spring hanger and the removal of a pedestal support at grade.

The other material upgrade that was completed was the auxiliary piping welded to the hot pump cases. This includes the hot pumps in the fire affected area with piping directly welded to pump the cases. The justification for using Inconel 625 was to allow this welding to take place while not requiring a post weld heat treatment (PWHT) of the pump case. The material is an upgrade to the existing CS piping, and the approved weld procedure for this weld (pump case to Inconel) is in accordance to ASME Section IX. The specification breaks for this piping is designed to be at the flange separating the plant piping (drain, warm-up, or vent) and the pump piping. All of these items are shown on the attached PSI documentation.

*When possible include copies of documents referenced in the summary.

Monday, November 26, 2012

Page 2 of 3

CUSA-EPA-0001946

INSTRUMENTATION REVIEW CHECKLIST

You have been assigned a Instrumentation Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number 25789

Filing Reference

Person Responsible Ketner, Joseph A.

Completed By Ketner, Joseph A.

Date Completed 11/18/2012

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.
This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.

INSTRUMENTATION:

- ☐ Alarm Objective Analysis
- ☒ Analyzer Instruments
- ☐ Chevron
- ☒ Control Valves
- ☒ DCS
- ☐ Egatrol
- ☒ Electrical One-lines
- ☒ Field Installation
- ☒ Flow Measurements
- ☒ Honeywell
- ☐ Honeywell Process Simulator
- ☒ Instrument Seals, Purges, and Winterizing
- ☒ Level Measurements
- ☒ Loop Diagrams
- ☒ P&ID Change due to New / Modified equipment
- ☒ P&ID's Change - Field condition not matching existing P&ID
- ☒ Pressure Measurements
- ☒ Process Alarms
- ☒ Process Control
- ☐ Relief Systems
- ☒ Shutdown Systems
- ☒ Temperature Measurements

SUMMARY OF REVIEW*

All instrumentation damaged or destroyed in the fire will be repaired and / or replaced or upgraded as outlined in a TAW package.

*When possible include copies of documents referenced in the summary.

ENVIRONMENTAL REGULATORY REVIEW CHECKLIST

You have been assigned a Regulatory Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number: 25789

Filing Reference:

Person Responsible: Chamberlin, Robert T.

Completed By: Perez, Carlos

Date Completed: 11/21/2012

Project/Equipment Title:

4 Crude Recovery - Process Piping Systems Material Changes

Check that all Apply:

Chevron:

- ☐ Yellow Book
- ☐ Correction or Alternations to Refinery Utility System (RI-503)

CITY OF RICHMOND

- ☐ CEQA (EIR's, etc
- ☐ City of Richmond Conditional Use Permits (Land use and Hazardous Materials)

Regulatory

- ☐ BAAQMD Air Regulations Permits (including Title V)
- ☒ BAAQMD Air Regulations: Additions, modifications, or deletions of VOC Components/Equipment (reg. 8-18 LDAR Program - equipment leaks/fugitive emissions)
- ☐ BAAQMD Air Regulations: Wastewater System components - reg 8-8 and NSPS QQQ (process drains, catch basins, manholes, sumps, cleanouts, oil-water separators)
- ☐ BAAQMD Air Regulations: Storage Tanks
- ☐ BAAQMD Air Regulations: Internal Combustion Engines
- ☐ BAAQMD Air Regulations: Flares
- ☐ BAAQMD Air Regulations: Boiler, Steam Generators, Process Heaters & Gas Turbines
- ☐ BAAQMD Air Regulations: SRU, Tail gas, or H2S Unit Changes
- ☐ BAAQMD Air Regulations: Long Wharf (Marine Terminal)
- ☐ Department of Transportation (DOT)

SUMMARY OF REVIEW*

This MOC is for the Metallurgy changes to piping only, as discussed with the ABU future MOC for piping installation will have to address VOC tagging of flanges and valves and ensure that all hazardous materials and sludge are removed from the scrapped pipe and equipment prior to sending to Reclamation for recycle or storage.

No other environmental regulatory issues.

*When possible include copies of documents referenced in the summary.

ENVIRONMENTAL REGULATORY REVIEW CHECKLIST

You have been assigned a Regulatory Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number: 25789

Filing Reference:

Person Responsible: Chamberlin, Robert T.

Completed By: Perez, Carlos

Date Completed: 11/21/2012

Project/Equipment Title:

4 Crude Recovery - Process Piping Systems Material Changes

- ☐ EPA Benzene NESHAP (National Emissions Standards for Hazardous Air Pollutants) (process vents, storage tanks, wastewater systems, transfer operations, fugitive emissions)
- ☐ EPA Benzene Waste Operations NESHAP (BWON)
- ☐ EPA MACT (Maximum Achievable Control Technology) Standards and Subparts (process units, storage tanks, wastewater system, fugitive emissions)
- ☐ EPA NSPS (New Source Performance Standards) and Subparts (storage tanks, flares, wastewater components, fugitive emissions, boilers, process heaters)
- ☐ Chemical Inventory / Hazardous Materials Business Plan (e.g. New Chemicals:RI-313)
- ☐ Risk Management and Prevention Plan (RMPP)
- ☐ RWQCB Waste Discharge Orders, EPA Consent Agreement Sites
- ☐ RWQCB NPDES Regulations/Permits
- ☐ RWQCB SB-1050, Waste Discharge Requirements (WDR)
- ☐ Spill Prevention Control and Counter Measures Plan (SPCC Plan)
- ☒ Waste Regulations and Permit
- ☐ Wharf and Shoreline Permitting related agencies (BCDC, Army Corps, SLC, USCG, OSPR, EPA)
- ☐ Permit to Build and Remove Wells, County Permit Required
- ☐ Activities impacting groundwater protection system (GPS) or WDO sites

Yes No

- ☐ ☒ Any additions, modifications, or deletions of VOC Components/Equipment (including drains or wastewater components) that will change VOC identification/tag

*When possible include copies of documents referenced in the summary.

SAFETY/ENVIRONMENTAL REVIEW CHECKLIST

You have been assigned a Regulatory Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

Project/Equipment Title:

4 Crude Recovery - Process Piping Systems Material Changes

MOC Number 25789

Filing Reference

Person Responsible Kirby, Anthony A.

Completed By Kirby, Anthony

Date Completed 11/21/2012

Yes No Health & Safety Regulatory Review:

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Changes to Refinery Instructions |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cal OHSA Construction Activity Permits |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Meets Legal and SID Requirements |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Hazardous Materials Business Plan Changes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Special OSHA Notifications Required |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Impacts RMP |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Additional Record Keeping Requirements |

SUMMARY OF REVIEW*

Process piping will be replaced close to same locations as previous. SID audits will be conducted throughout rebuild to assure compliance.

BUILDING PERMITS REVIEW CHECKLIST

You have been assigned a Regulatory Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

Project/Equipment Title:

4 Crude Recovery - Process Piping Systems Material Changes

MOC Number 25789

Filing Reference

Person Responsible Tuma, Dennis A.

Completed By Tuma, Dennis A.

Date Completed 11/19/2012

SUMMARY OF REVIEW*

Based on the information provided, no City of Richmond building permit required for the installation of process piping. Structural pipe supports do require a City of Richmond building permit.

INSPECTION REVIEW CHECKLIST

You have been assigned a Inspection Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number 25789

Filing Reference

Person Responsible Beauregard, John T.

Completed By Beauregard, John T.

Date Completed 11/21/2012

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.

This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.

INSPECTION:

- ☐ Additional Surveillance Required
- ☐ API Standards
- ☐ ASME Codes & Standards
- ☐ ASTM Standards
- ☐ Control Monitoring Requirements
- ☐ Electrical Inspection
- ☐ Fitness for Service Evaluation
- ☐ Honeywell
- ☐ Honeywell Process Simulator
- ☐ Inspection/Monitoring Requirements
- ☐ Non-Destructive Examination
- ☐ Normal Control Requirements
- ☐ Positive Materials Identification
- ☐ Relief and Pressure Relief Devices Setting and Capacity
- ☐ Texas Nuclear (Metallurgy)
- ☐ UT Testing
- ☐ VOC Tagging Requirements

SUMMARY OF REVIEW*

Following Material engineering review the optimal choice for the high temperature piping in the Richmond 4 Crude unit was found to be 9Cr at the 3 and 4 S/C systems directly off the column is my understanding.

CML evaluation will be performed by the FER area inspector for the Crude Unit to determine if any of the data points should change. Changes include relocating, increasing and decreasing the total number and frequency. Crude Unit SME manuals and Refinery piping guidelines will be the instructional tools used to determine the amount and location of CMLs. Base line readings will be required. Chevron weld inspection is following the NDE on the newly installed piping circuits.

*When possible include copies of documents referenced in the summary.

METALLURGY REVIEW CHECKLIST

You have been assigned a Metallurgy Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number 25789
Filing Reference
Person Responsible Prasad, Praneil-Maharaj
Completed by Prasad, Praneil-Maharaj
Date Completed 11/21/2012

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.
This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.
TAW# - 17271, 17311, 17312, 17531, 17532, 17548, 17568, 17598, 17599, 17600, 17604, 17621, 17622, 17623, 17812, 17826, 17832, 17844, 17848, 17849, 18237, 18319, and 18405.

Refinery Process Stream: Crude Unit

Service Description: Hydrocarbon (Crude)

Process: Hydrocarbon

Other:

Operating Temperature:

Operating Pressure:

Design Temperature:

Design Pressure:

Product Form:

Piping Classification:

Equipment

Other:

New Material Type: 9 Cr-1 Mo

Other:

Connection for Piping Specification: ☐ Stress Relieved

Piping Specification Comment:

If Required, what is stress relieving temperature: and Time

Exchanger Bundle (Check all Applicable)

- ☐ U-Bend Tube Bundle ☐ U-Bend Area Stress Relieved?
☐ Finned Tube Bundle ☐ Finned Area Stress Relieved?
☐ Straight Tube
☐ Tube Sheet and tubes made of different alloys? Explain:
☐ Cladded Tube sheet. Which side is clad?
☐ Other

Specification Change:

Other: A primary damage mechanism present in the Crude Unit is High Temperature Sulfidation. Increased chromium content in material helps resist the degradation caused by this mechanism. 9 Cr provides increased resistance to high temperature sulfidation and provides an operating temperature range 200 deg F above CS. Inconel 625 piping was chosen to transition the carbon steel cases to 9 Cr piping on vent/drain connections, since this mitigates the need for a PWHT if a CS pump case was directly welded to 9 Cr piping. Inconel 625 has increased resistance to chloride pitting and chloride stress corrosion cracking, which minimize issues during startups and shutdowns of the unit where liquid water can contact these areas. In addition, the material is essentially immune to high temperature sulfidation.

CONSTRUCTION REVIEW CHECKLIST

You have been assigned a Construction Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number 25789

Filing Reference

Person Responsible Costa, Steve W.

Completed By Costa, Steve W.

Date Completed 11/21/2012

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.

This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.

CONSTRUCTION:

- | | |
|--|--|
| <input type="checkbox"/> Building Permits | <input type="checkbox"/> Site Specific Hazards |
| <input type="checkbox"/> Construction Limitations | <input type="checkbox"/> Site Limitations |
| <input type="checkbox"/> Coordination with Multiple Plant | <input type="checkbox"/> Soil Removal |
| <input checked="" type="checkbox"/> Coordination with Plant Protection | <input type="checkbox"/> Traffic Control |
| <input checked="" type="checkbox"/> Cranes | <input checked="" type="checkbox"/> Weather |
| <input checked="" type="checkbox"/> Equipment Drawings | |
| <input type="checkbox"/> Fire Protection Access/Requirement | |
| <input type="checkbox"/> Honeywell | |
| <input type="checkbox"/> Honeywell Process Simulator | |
| <input checked="" type="checkbox"/> Hot Work | |
| <input type="checkbox"/> Lay Down | |
| <input type="checkbox"/> Personnel Qualification/Training | |
| <input type="checkbox"/> Piles | |
| <input checked="" type="checkbox"/> Plot Plan | |
| <input type="checkbox"/> Restricted Area Classifications | |
| <input type="checkbox"/> Schedules | |

SUMMARY OF REVIEW*

Material Change only. Pipe Size and Routing does not change

*When possible include copies of documents referenced in the summary.

Monday, November 26, 2012

Page 1 of 1

CUSA-EPA-0001954

RELIEF SYSTEM REVIEW CHECKLIST

You have been assigned a Relief System Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number 25789

Filing Reference

Person Responsible Muha, Edward

Completed By Muha, Edward

Date Completed 11/21/2012

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.

This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.

RELIEF SYSTEM

- | | |
|--|--|
| <input type="checkbox"/> Abnormal Heat Input | <input checked="" type="checkbox"/> Material of Construction |
| <input type="checkbox"/> Blocked Outlet | <input type="checkbox"/> P & ID and Isometric Update |
| <input type="checkbox"/> Chemical Reaction | <input type="checkbox"/> Power Failure |
| <input type="checkbox"/> Columns & Pressure Vessels | <input type="checkbox"/> Reflux Failure |
| <input type="checkbox"/> Cooling Failure | <input type="checkbox"/> Relief Study Update |
| <input type="checkbox"/> Entrance of Volatile Material | <input type="checkbox"/> Relief Valve Back Pressure |
| <input type="checkbox"/> Heat Exchanger Tube Rupture | |
| <input type="checkbox"/> Honeywell | |
| <input type="checkbox"/> Honeywell Process Simulator | |
| <input type="checkbox"/> Hydraulic Expansion | |
| <input type="checkbox"/> Inadvertent Operating of Manual Valve | |
| <input type="checkbox"/> Instrument Air failure | |
| <input type="checkbox"/> Internal Explosion | |
| <input type="checkbox"/> Loss of Upstream Heating | |

SUMMARY OF REVIEW*

Changing the material of construction in the relief system will not effect the performance of the relief system. Change in the piping diameter or schedule will need to be reviewed by relief system SME.

INSPECTION REVIEW CHECKLIST

You have been assigned a Inspection Review. This checklist is a guide to help ensure that all information necessary to evaluate the change is considered.

MOC Number: 25789

Completed On: 11/20/2012

Completed By: Bosworth, Gregory A.

Person Responsible: Bosworth, Gregory A.

Project/Equipment Description:

To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.

This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass piping, C-1100 bottoms piping, and C-1100 inlet transfer line.

Yes	No	Plant Protection/Security Review
<input checked="" type="checkbox"/>	<input type="checkbox"/>	City Fire-Plan Review is Mandato
<input checked="" type="checkbox"/>	<input type="checkbox"/>	City Fire-Permit is Mandato
<input checked="" type="checkbox"/>	<input type="checkbox"/>	City Acceptance Test is Mandato
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Office of Fire Prevention Review On

Your project must reviewed by the Richmond Fire Marshal before work can begin. Please call 2-4568 for additional details.

Scope of work may require a hot work permit (open flame or no-open flame). Please call 2-4200 and request a job review /hot work permit.

*When possible include copies of documents referenced in the summary.

HEALTH & SAFETY EVALUATION

Date Issued: 11/17/2012
ABU: D&R
Plant: 4 Crude

Maximo Number: _____
EWO Number: _____

MOC Number: 25789
Filing Reference: _____
Person Responsible: Simmons, Corey
Completed By: Simmons, Corey
Date Completed: 11/21/2012

Section 2 Reviewer: Preciado, Silvano E.

Project/Equipment Title: 4 Crude Recovery - Process Piping Systems Material Changes

Description: To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.
This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass

Step 1: ☐ Notify USW ☐ USW Representation Present **USW Representative:** Al Cruz

Worker's Committee Member/Steward's comments if unable to attend:

☐ Notify Trainer ☐ Trainer Representation Present **Training Representative:** Phil Bessire

Step 2: Involve: Operations, Maintenance, Technical and others with appropriate expertise relevant to the change (CRTC, Contractors, etc)

Attendees: Corey Simmons, Steve Costa, Patrick Taylor, John Beauregard, Phil Bessire, Ken Sohnrey, Al Cruz, Mike Story, Ronad McCallum, Praneil Prasad, Terry Palumbo, Dennis Foster and Sil Preciado

Step 3: Think about the task at hand. Discuss the existing situation. Discuss the change. Discuss the impact of the change on the existing situation. Determine the training requirements for this change.

Step 4: Training Type: 1

Develop a list of concerns, consider your options, consider your following:

*H2S *NH3 *Acid *Caustic *Benzene *Fall Protection *Staging *Scott Air *PPE *Hot Work *Confined Space Entry *Evacuation Plan *Safety Operator

Concern	Consequence	Mitigation	Proceed Safely
Is 9CR different in cleaning the piping?	Could be different	No, it's the same as Carbon Steel	Yes
Blinds get taken out	Could install wrong blind, corrosion failure	Need to stamp 9Cr blinds	Yes
Spec blinds wrong material	Corrosion failure, flange leak	Update routine duty for drop out spools to identify correct material is in place	Yes
Clean up procedures to match material (9CR)	Could clean up wrong, affect piping	Identify piping system materials	Yes
Bypass hot product at spec break pass first temperature reducing equipment	Increase degradation of lesser alloy.	Will be handled on another MOC	Yes

HSE Action Items

Additional Comments

HEALTH & SAFETY EVALUATION

Date Issued: 11/17/2012

Maximo Number: _____

MOC Number 25789

ABU: D&R

EWO Number _____

Filing Reference _____

Plant: 4 Crude

Person Responsible Simmons, Corey

Section 2 Reviewer: Preciado, Silvano E.

Completed By Simmons, Corey

Project/Equipment Title: 4 Crude Recovery - Process Piping Systems Material Changes

Date Completed 11/21/2012

Description: To replace process piping damaged by the 4 Crude Unit fire in 2012. Includes the TAW's that apply to the various process piping systems which had material changes, e.g., 5CR to 9CR.
This MOC covers the upgrade of piping systems from carbon steel to 9 Chrome. These piping systems include 3 side cut, 4 side cut, reboiler bypass

9CR can handle higher temperatures. Being used in fire affected areas.

Stage Two Training and Communication Review

11/26/2012 12:16:56 PM

- ☐ Identify the affected employees.
 - * Maintenance and Technical affected?
 - * Employee who will require training to start up the change based on the level of training.
 - * Employees who will receive training after the start up BUT before they can perform work affected by the change
- ☐ Procedures have been modified/written (Ops/SSO/Trainer)
- ☐ Identify the affected employees..
 - * Lesson plan cover sheet (includes training objective statement and list of affected employees)
 - * Procedural changes (Standing Orders, mark-ups)
 - * Flow daigrams (final or mark-ups)
- ☐ Determine level of training
- ☐ Training has been scheduled
- ☒ Affected employees have been trained in order to start up the change.

MOC No: 25789

Date Completed: 11/22/2012

Completed By: Bessire, John P.

Person Responsible: Bessire, John P.

Project/Equipment Title:

4 Crude Recovery - Process Piping Systems Material Changes

Summary of Review:

Most of this piping is replacement in kind with a metalluary up grade from carbon steel to 9 chrome